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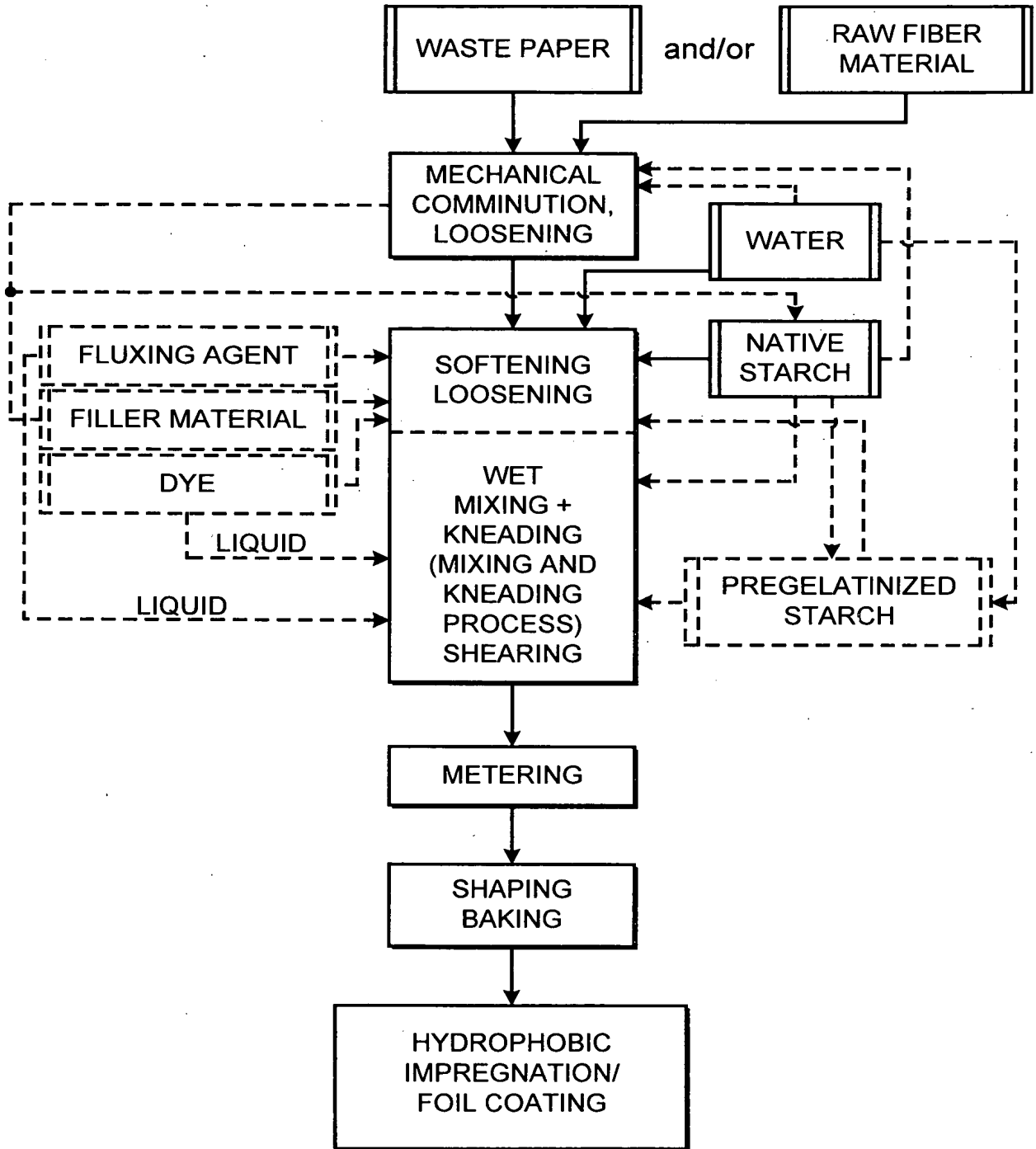


FIG. 1

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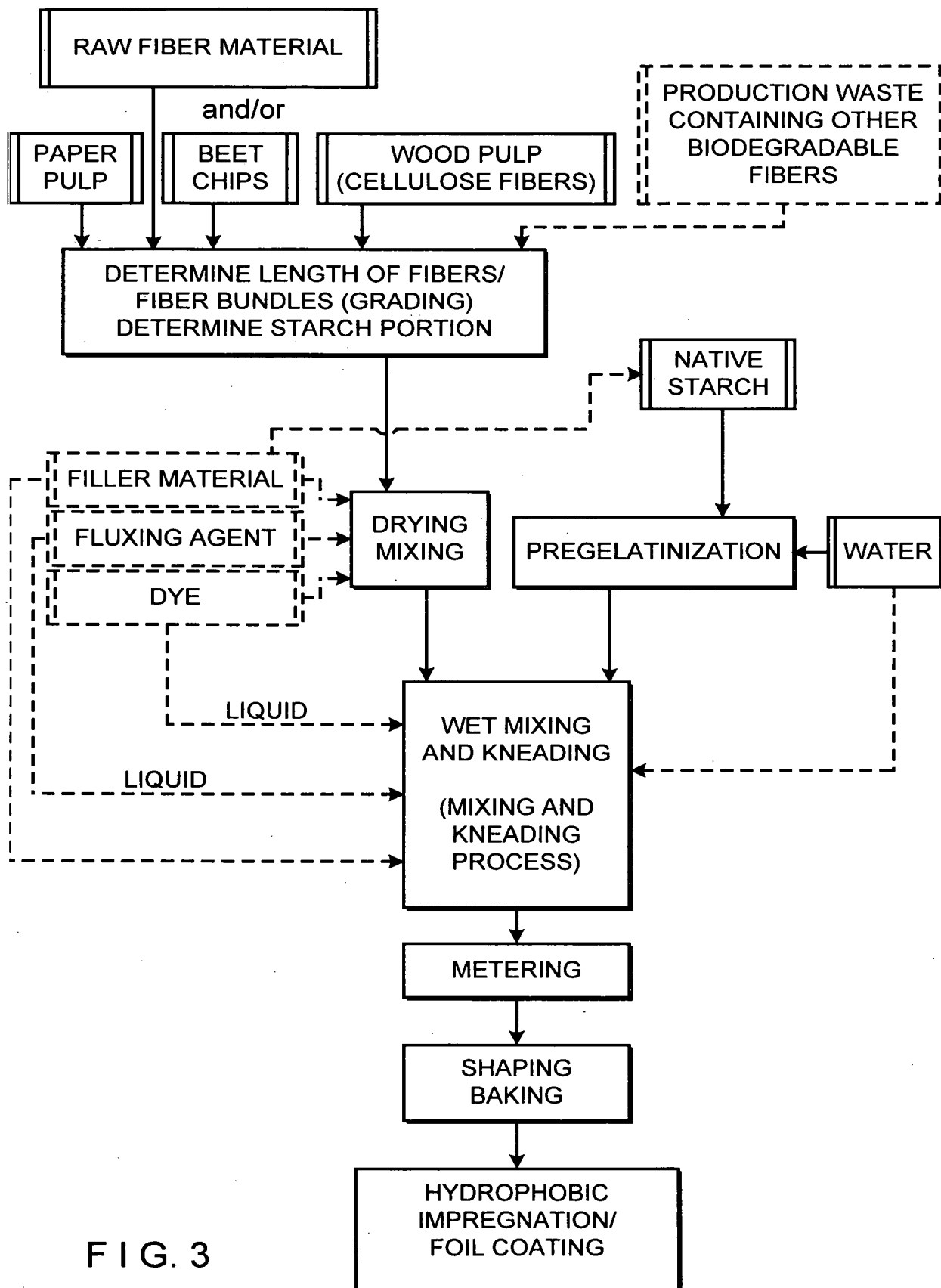
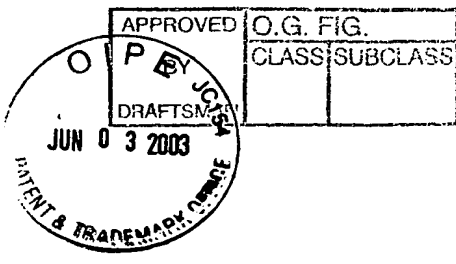


FIG. 3



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	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
a	18,7	28,2	37,2	47	56,4	65,6	75	84,3	93,3	102,9	112,3	122	131,4	140,8	150

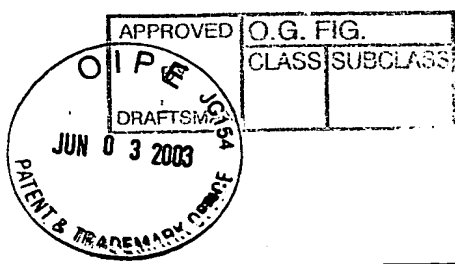
X₁₋₁₅ test sample

a in wt. % native starch

b = 250 wt. % water (in relation to dry mass of fiber material)

c = 100 wt. % fiber material

FIG. 4a



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	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
a	18,7	28,2	37,3	47	56,4	65,8	75	84,3	93,3	102,9	112,3	122	131,4	140,8	150
d	6,3	9,1	12,7	15,7	18,8	21,9	25	28,3	31,3	34,9	37,7	40,7	43,8	46,9	50
e	24,9	37,8	50	62,7	75,2	87,7	100	112,7	124,7	137,8	150	162,7	175,2	187,7	200

X₁₋₁₅ test sample

a in wt. % native starch

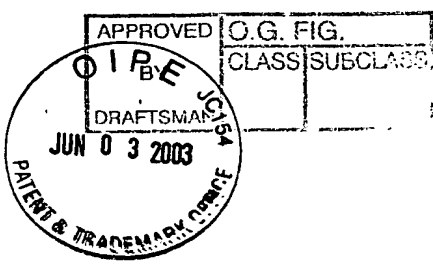
d in wt. % pregelatinized starch

e in wt. % total starch

b = 250 wt. % water (in relation to dry mass of fiber material)

c = 100 wt. % fiber material

FIG. 5a



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ratios

test sample	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	y11	y12	y13	y14	y15
a	25	94	113	131	150	169	188	205	225	244	283	261	300	150	75
d	75	31	38	44	50	58	63	69	75	81	86	94	100	100	100
	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400

a = native starch in wt. %

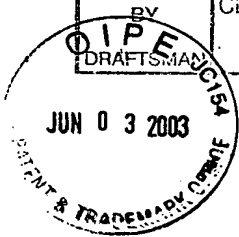
d = pregelatinized starch in wt. %

e = total starch in wt. %

b = 500 wt. % water in relation to fiber material (dry substance)

c = 100% fiber material

FIG. 5b



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Grade	Long fibers/ fiber bundles [mm]
1	0.96 - 1.44
2	1.92 - 2.40
3	2.40 - 2.88
4	0.72 - 2.16
5	3.06 - 3.57
6	2.55 - 4.59
7	0.24 - 1.68
8	0.24 - 4.32

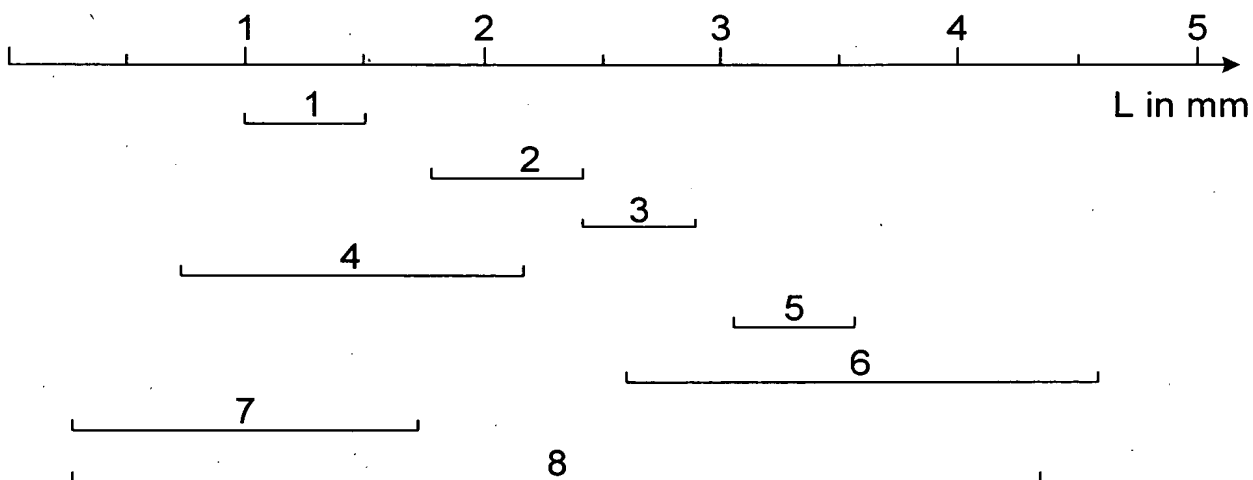
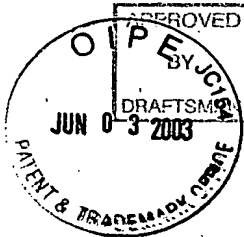


FIG. 6



APPROVED	O.G. FIG.
CLASS	SUBCLASS

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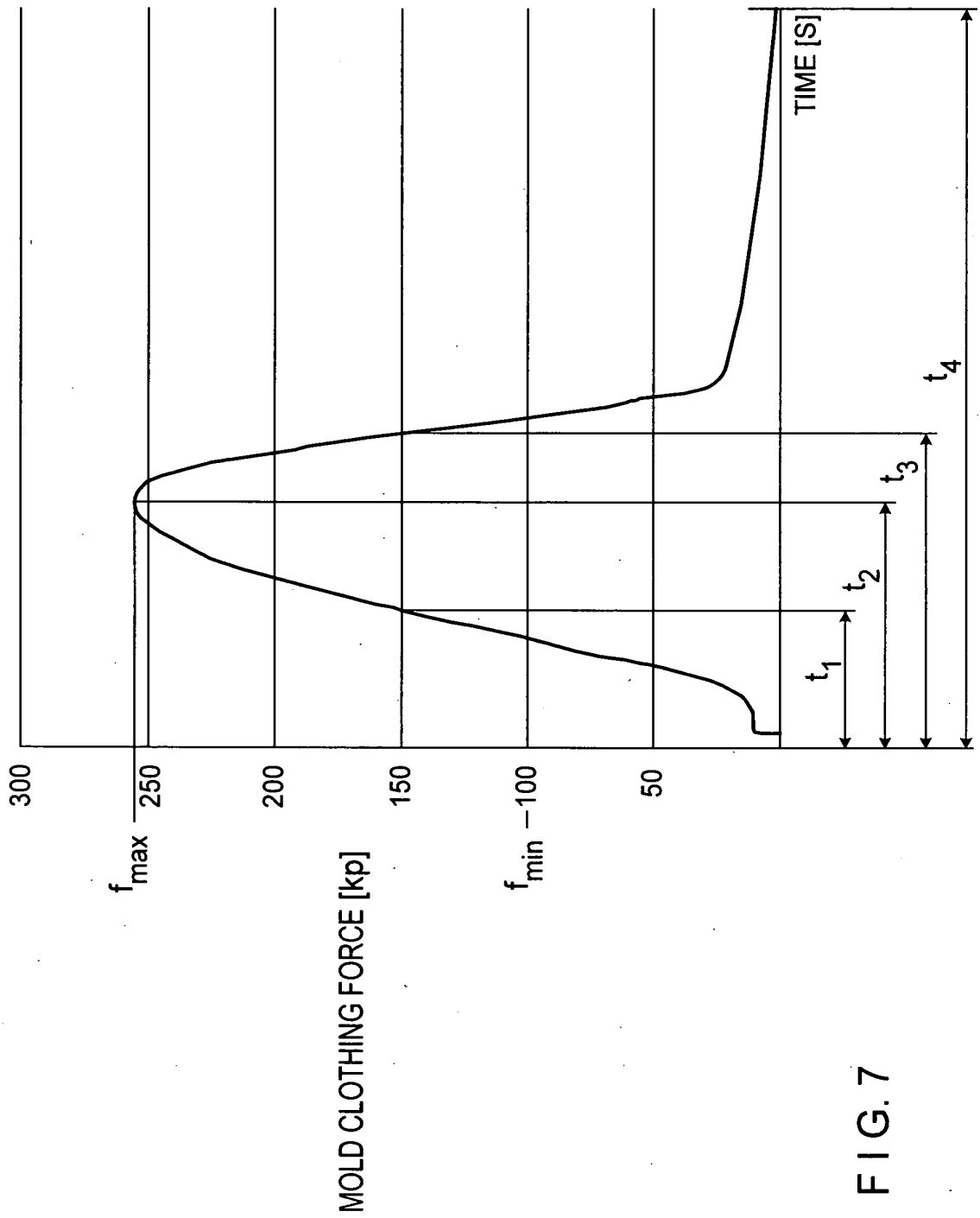


FIG. 7



APPROVED	O.G. FIG.
CLASS	SUBCLASS
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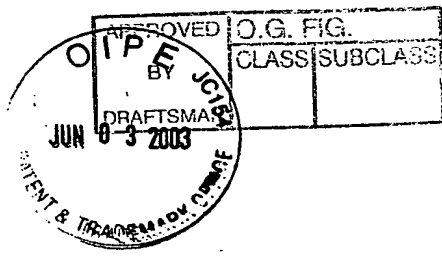
Use of fibers (fiber bundles) graded by fiber length according to Fig. 6

mold depth	=30 mm								= 50 mm							
fiber length	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
surface/ texture	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	-
strength/ stability	-	-	-	+	-	-	+	+	-	-	-	+	-	+	+	+
elasticity/ structure	-	-	-	+	-	+	+	+	-	-	-	+	-	+	+	+

mold depth	= 80 mm								> 80 mm							
fiber length	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
surface/ texture	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
strength/ stability	-	-	-	+	-	+	+	+	-	-	-	+	-	+	+	+
elasticity/ structure	-	-	-	+	-	+	+	+	-	-	-	+	-	+	+	+

- + molded body according to requirements
- molded body not according to requirements

FIG. 8



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Use of fibers mixtures of different fiber length according to Fig. 6

mold depth	= 30 mm	= 50 mm	= 80 mm	> 80 mm
combination of fiber length according to Fig. 6	7 + 4 4 + 2	7 + 2 + 3 4 + 2 + 3	8 7 + 2 + 3 + 5	8 7 + 2 + 6 8 + 6
surface/ texture	- +	- +	+ -	+ - +
strength/ stability	+ +	+ +	+ +	+ + +
elasticity/ structure	- +	+ -	+ +	+ + +
fiber material/ starch	60 : 40	55 : 45	50 : 50	45 : 55
starch/water	0,4 : 1	0,4 : 1	0,4 : 1	0,3 : 1

- + molded body according to requirements
- molded body not according to requirements

FIG. 9

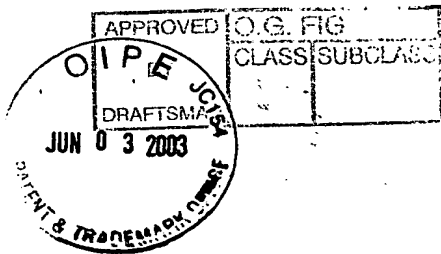
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in wt. %	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
fiber material to total mass	26,7	25,8	25	24,2	23,5	22,8	22,2	21,6	21,1	20,5	20	19,5	19	10,6	18,2
total starch to total mass	6,6	9,7	12,5	15,2	17,7	20,1	22,2	24,3	26,2	28,2	10	11,7	33,4	34,9	16,3
water to total mass	66,7	64,5	62,5	60,6	58,8	57,1	55,6	54,1	52,7	51,1	50	48,8	47,6	46,5	15,5
pragelatinized starch to total mass	1,6	2,4	3,2	3,8	4,4	5	5,5	6,1	6,6	7,1	7,5	7,9	8,4	8,7	9

X₁₋₁₅ test sample

FIG. 10



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Percent by weight in mass

in wt. %	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	y11	y12	y13	y14	y15
fiber/mass	14,3	13,8	13,3	12,9	12,5	12,1	11,8	11,4	11,1	10,8	10,5	10,3	10,0	11,8	12,9
total starch/ mass	14,3	17,2	20,0	22,6	25,0	27,3	29,4	31,4	33,3	35,1	36,8	38,5	40,0	29,4	22,6
pregelatinized starch/mass	10,7	4,3	5,0	5,6	6,3	6,6	7,4	7,9	8,3	8,8	9,2	9,6	10,0	11,8	12,9
water/mass	71,4	69,0	68,7	64,5	62,5	60,8	58,3	57,1	55,6	54,1	52,8	51,3	50,0	58,8	64,5

y1-15 = test sample

FIG. 11

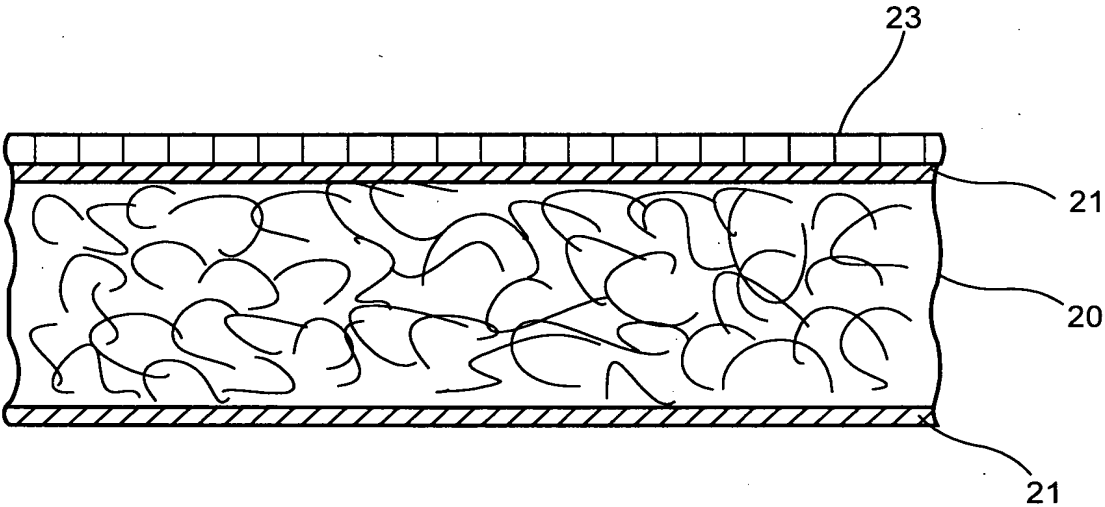


FIG. 12



APPROVED	O.G. FIG.
DRAFTSMAN	CLASS/SUBCLASS

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Trays dimensions 112 x 200 x 17.5 mm

Pots dimensions ϕ 125 mm, vol. 500 ml, height 76 mm

Recipe: Y14

Coating: cellulose acetate (CA)

TS: 4.5% - 15 wt. % dry substance in spray solution

η : 20 - 4000 mPas (viscosity)

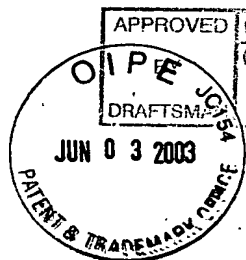
Application: spraying, casting, dipping

Layers: 1 - 3 (quantity)

Solvent: acetone

Shape	Thick- ness	Coating	Method	Resistance		
				water 100°C 1h	oil (cold) 3 days	water (cold) 3 days
pot	89 μ m	3.8 g	casting	+	+	+
tray	79 μ m	2.3 g	casting	+	+	+
pot	65 μ m	2.8 g	spraying	+	+	+
tray	68 μ m	2.0 g	spraying	+	+	+
tray	58 μ m	1.7 g	spraying	+	+	+
pot	34 μ m	1.5 g	spraying	-	-	-
tray	27 μ m	0.8 g	spraying	-	-	-

FIG. 13



APPROVED	O.G. F/G
CLASS	SUBCL

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Trays dimensions 112 x 200 x 17.5 mm

Pots dimensions ϕ 125 mm, vol. 500 ml, height 76 mm

Recipe: Y14

Coating: cellulose acetate propionate (CAP)

TS: 9% - 20 wt. % dry substance in spray solution

η : 200 - 6000 mPas (viscosity)

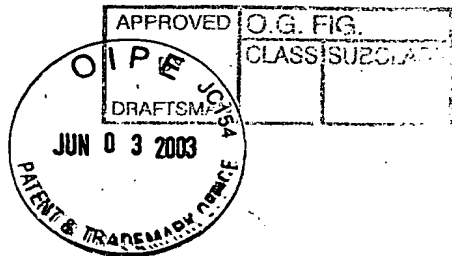
Application: spraying, casting, dipping

Layers: 1 - 3 (quantity)

Solvent: acetone

Shape	Thickness	Method	Resistance		
			water 100°C 1h	oil cold 3 days	water cold 3 days
pot	88 μ m	casting	+	+	+
tray	88 μ m	casting	+	+	+
pot	58 μ m	spraying	+	+	+
tray	70 μ m	spraying	+	+	+
tray	56 μ m	spraying	+	+	+
pot	33 μ m	spraying	-	-	-
tray	22 μ m	spraying	-	-	-

FIG. 14



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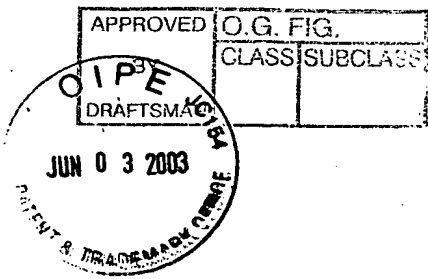
Trays dimensions 112 x 200 x 17.5 mm

Pots dimensions ϕ 125 mm, vol. 500 ml, height 76 mm

No.	Foil	Thick- ness	Deep- drawing quality in tray	Deep- drawing quality in tray	Resistance		
					water 100°C	oil cold	water cold
1	polyester amide	100 μ m	+	-	-	+	+
		150 μ m	+	-	—	+	+
2	polyester	70 μ m	+	-	—	+	+
3	polylactic acid (rigid)	50 μ m	-	-	-	+	+
		100 μ m	-	-	-	+	+
4	polylactic acid (elast.)	50 μ m	+	-	+	+	+
		100 μ m	+	+	+	+	+

Foil	Melting point
1	approx. 120°C
2	approx. 85°C
3	approx. 115°C
4	approx. 130°C

FIG. 15

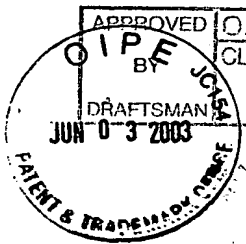


Cellulose acetate / Cellulose acetate propionate

Softener 10 - 30 wt. %					Without softener
Diethyl - phthalate		Triacetin	Tributyl citrate	Acetyl tributyl citrate	
CA	V + / H +	V + / H +	V - / H -	V - / H -	H O
CAP	V + / H +	V + / H +	V + / H +	V + / H +	H +

Key: + = good o = medium - = poor
 V = compatibility H = adhesion

FIG. 16



APPROVED	O.G. FIG.
BY	CLASS/SUBCLASS
DRAFTSMAN	

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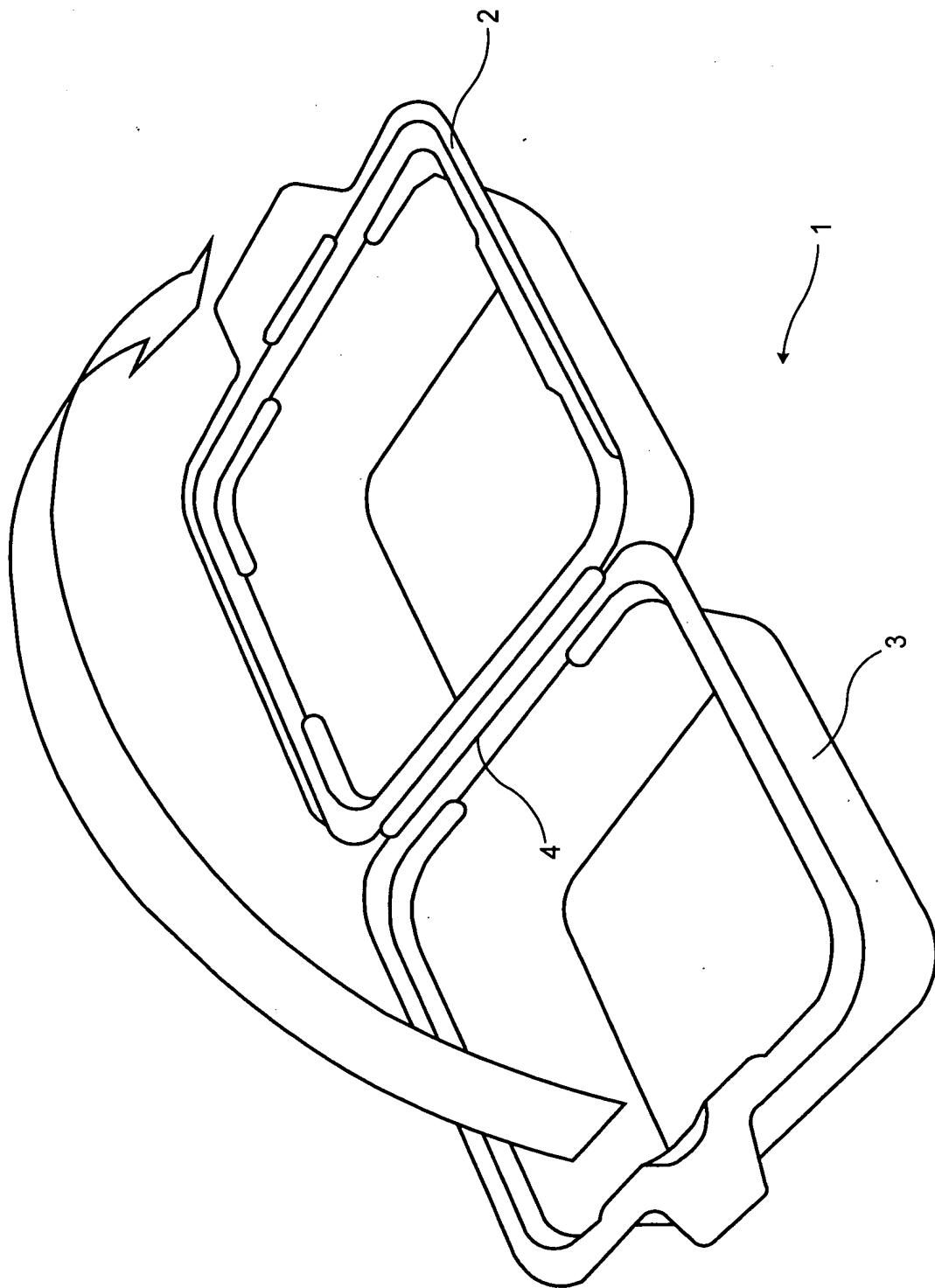


FIG. 17



APPROVED	O.G. FIG.
CLASS	SUBCLASS

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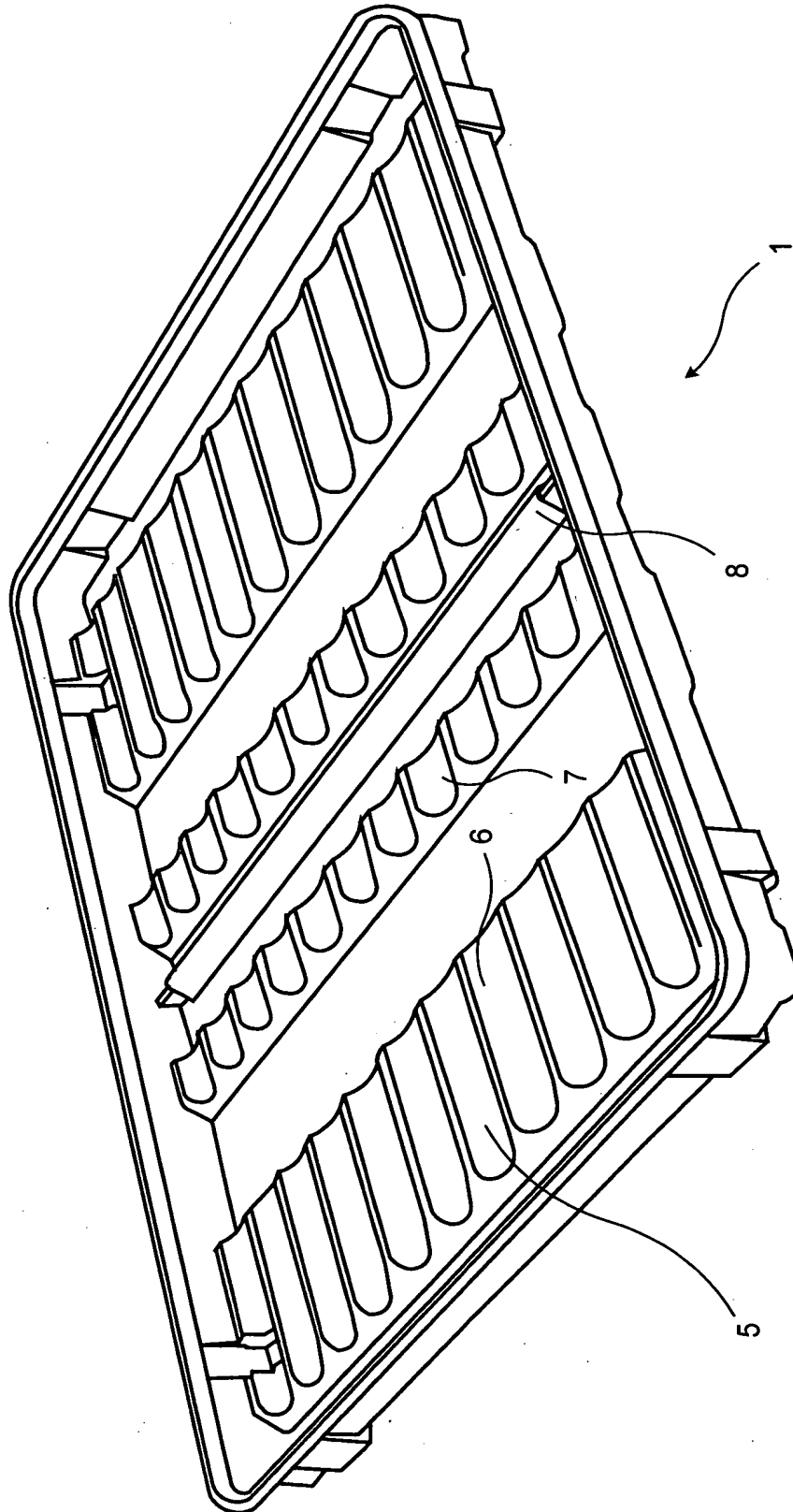
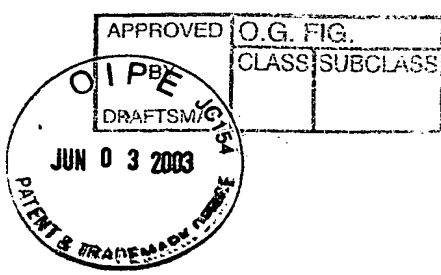


FIG. 18



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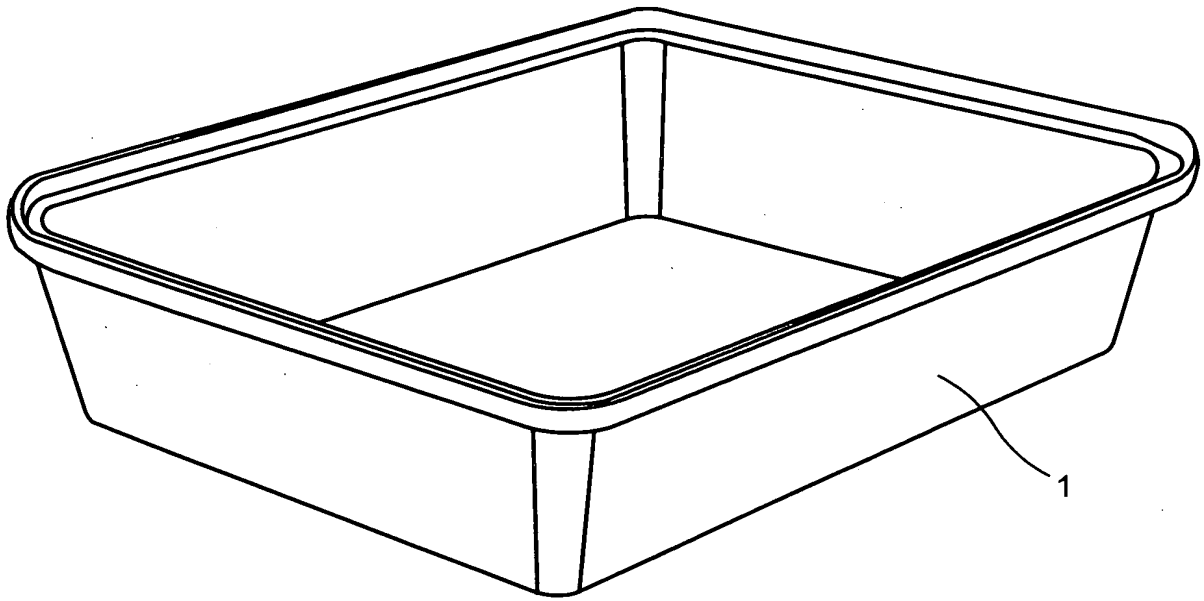
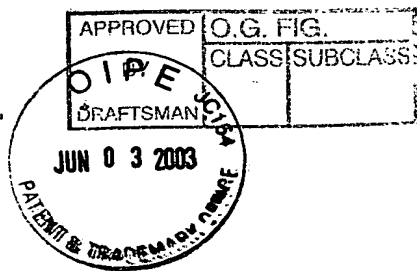


FIG. 19



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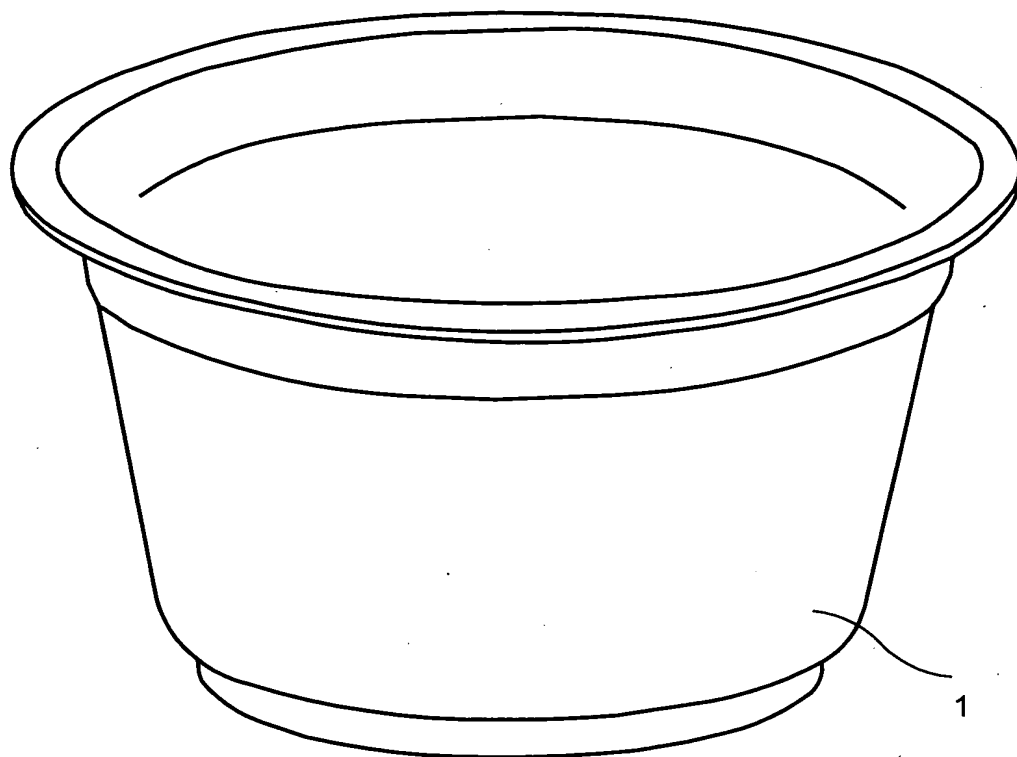


FIG. 20